UNIT III

HOW TO PERFORM RCM

Module 3

ON CONDITION TASK

ON CONDITION TASK

Module Preview:

Introduction

- **Introduction**
- **Task Development**
- **Review and summary**

ON CONDITION TASK

Module Objective:

Introduction

This module will provide information for developing and evaluating On Condition tasks:

1. Identify when it is appropriate to develop an On Condition task

2. Show how to develop an On Condition task for a given failure mode

3. Show how to determine an appropriate task interval for an On Condition task

ON CONDITION TASK

ON CONDITION TASK DEVELOPMENT

ON CONDITION TASK

On Condition Task:

Task Development

Definition - A periodic or continuous inspection designed to detect a potential failure condition prior to functional failure

- **If the inspection reveals a potential failure condition, corrective action must be taken**
- **If potential failure condition does not exist, nothing is done, item continues in service**

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On Condition Task:

Task Development

- **On-condition task objective is to maximize the useful life of each piece of equipment by allowing operation until a potential failure is detected**
- **Task includes only inspection portion of the maintenance action**
- **Can be accomplished with Condition Monitoring/PdM/PHM systems**

ON CONDITION TASK

Questions:

Task Development

- What is the **Functional Failure**?
- What is the **Potential Failure**?
- What is the **Potential Failure to Functional Failure (PF) interval** and how consistent is it?
- Can a task be developed that provides **an acceptable probability of detecting the potential failure prior to functional failure**?
- Is the **task** and **required interval** practical?

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Functional Failure:

Task Development

- ***Inability of item to perform a specific function within specified performance limits***
- **Functional Failure is identified and documented during FMECA**
  - **FF condition may be redefined for purposes of OC task**
  - **If function ceases, Functional Failure has occurred**
  - **May also be defined as prior to complete loss of function**
- **Must be known before valid Potential Failure-to-Functional Failure interval can be established**

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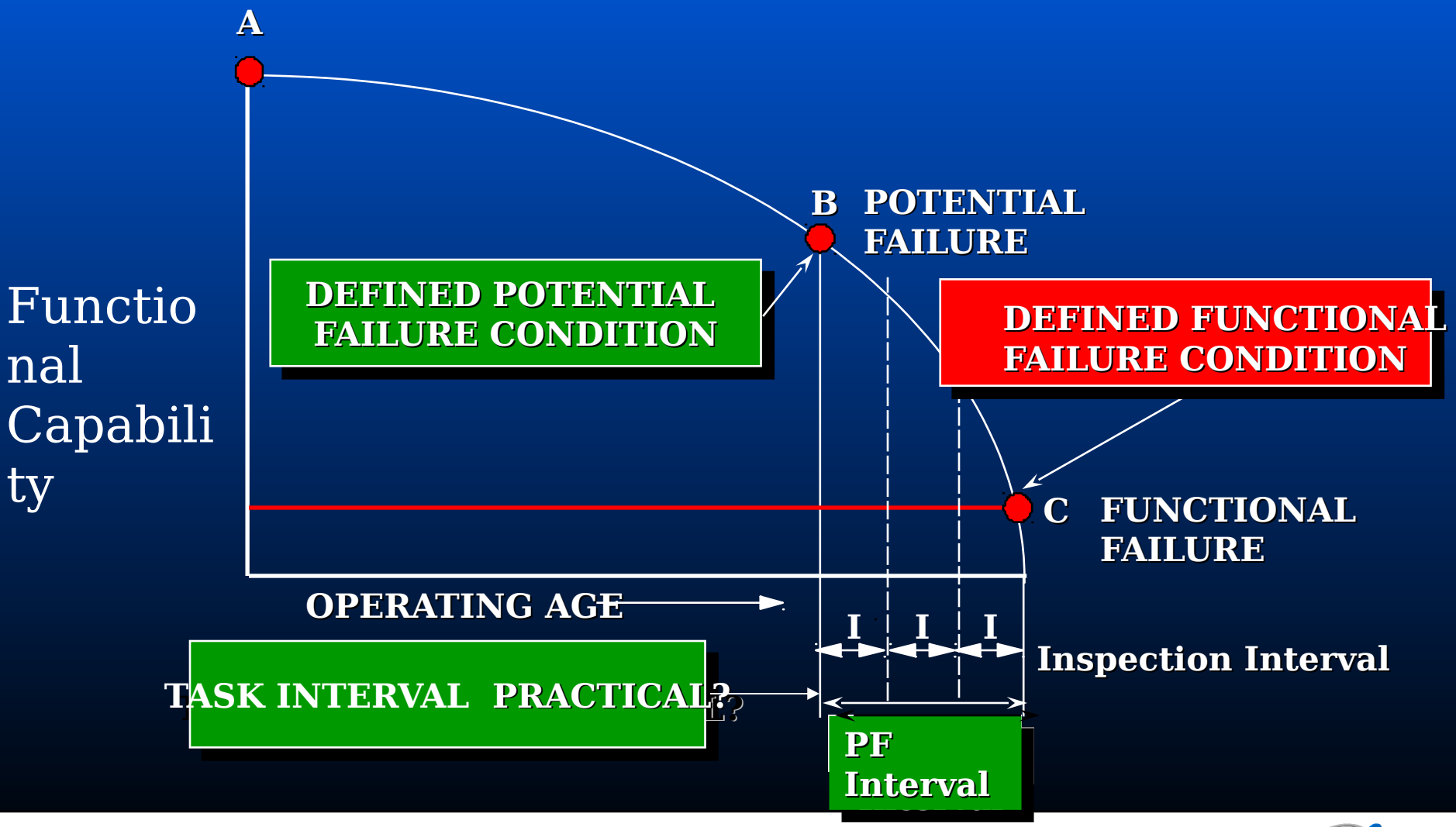
Functional Failure:

Task Development



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Potential Failure:

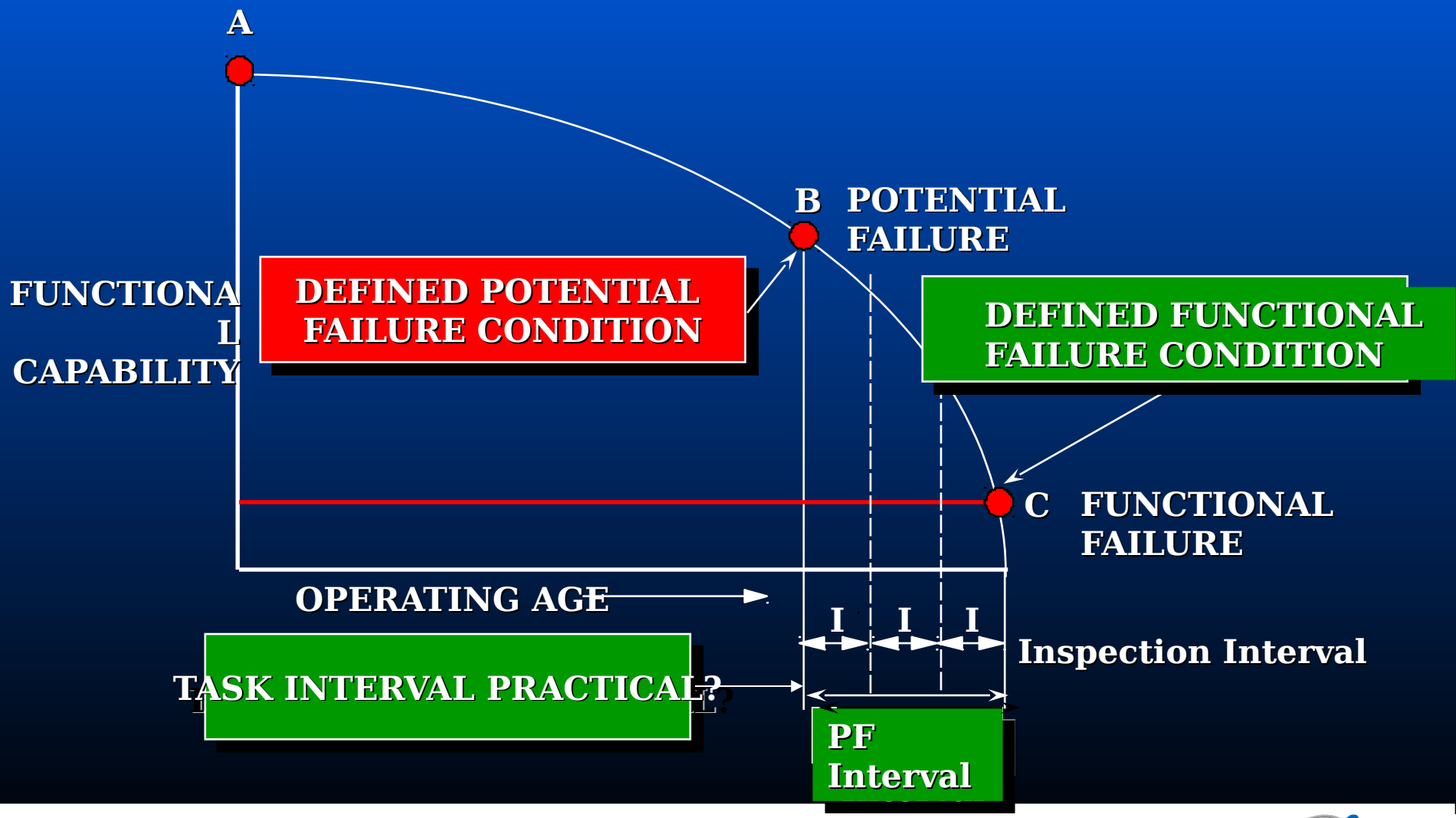
Task Development

- ***Definable and detectable condition that indicates a functional failure will occur***
- **Potential failure is a definable and detectable degradation characteristic**
- **Defining Potential Failure:**
  - **at earliest detectable condition will lengthen the On Condition task interval**
  - **closer to functional failure will allow greater usage of available life of item**

ON CONDITION TASK

Potential Failure:

Task Development



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PF Interval:

Task Development

PF Interval: ***The time in some traceable operating unit between occurrence of potential and functional failure***

Safety consequences:

- **PF interval may need to be determined analytically or through laboratory testing**
- **Method used depends on the failure mode**
- **Age Exploration may be necessary to collect data**

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PF Interval:

Task Development

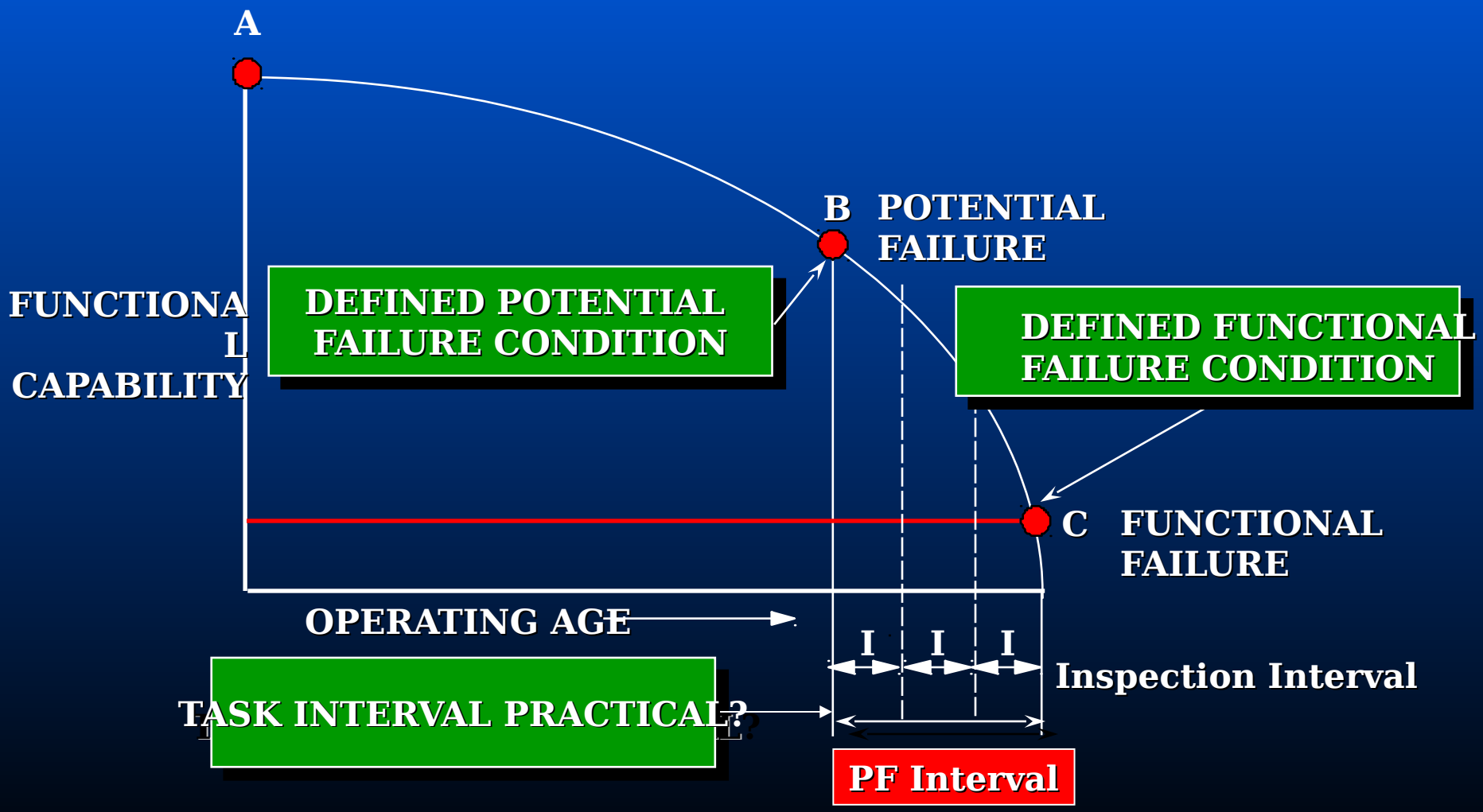
Non-Safety consequences:

- **Gather data from experience/CMMS data**
- **Age Exploration on in-service equipment**
- **Method used depends on the failure mode**

ON CONDITION TASK

PF Interval:

Task Development



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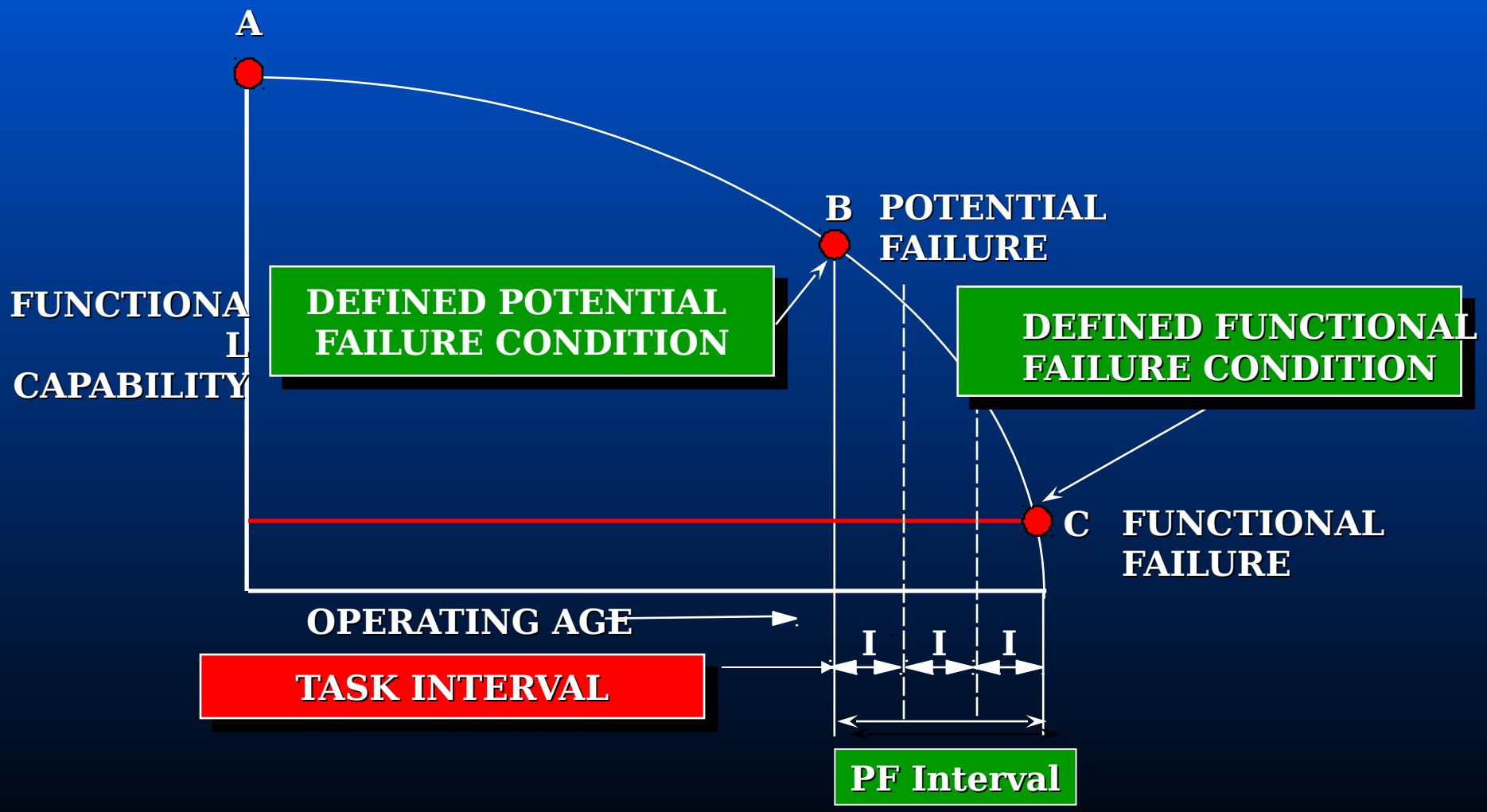
Determining Task Interval: **Task Development**

- **Task interval determined from PF interval**
- **Usually, inspection must occur at least once during PF interval**
- **More inspections during the PF interval may be required to ensure acceptable levels of safety, mission, and economics are achieved**

ON CONDITION TASK

Task Interval :

Task Development



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Determining Task Interval: **Task Development**

Inspection Interval (I): (Ref: NAVAIR 00-25-403)

$$I = PF/n$$

where:

PF = interval from potential failure to functional failure

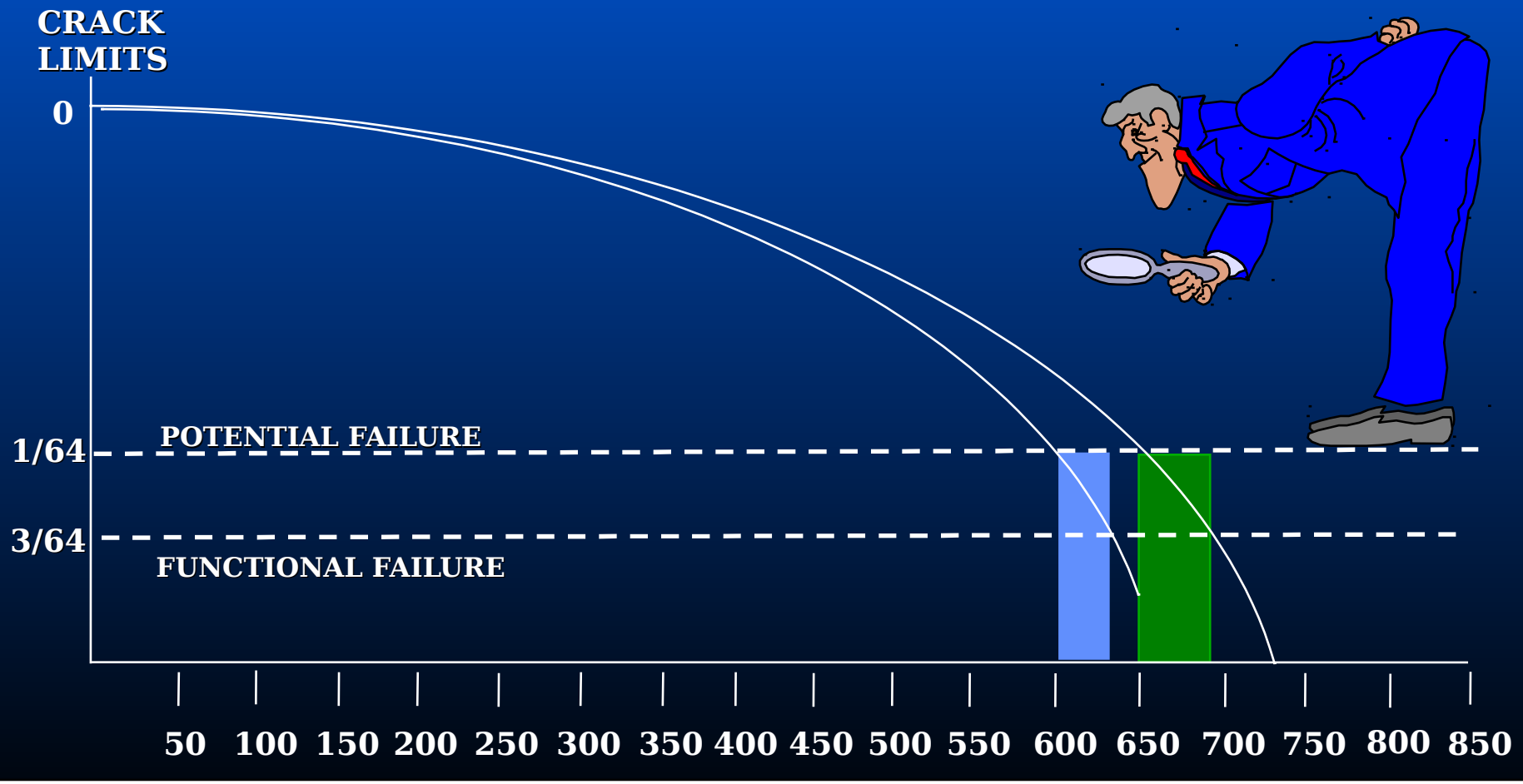
n = number of inspections during PF interval

ON CONDITION TASK

Example:

Task Development

Determining On Condition Inspection Interval for Tail Hook

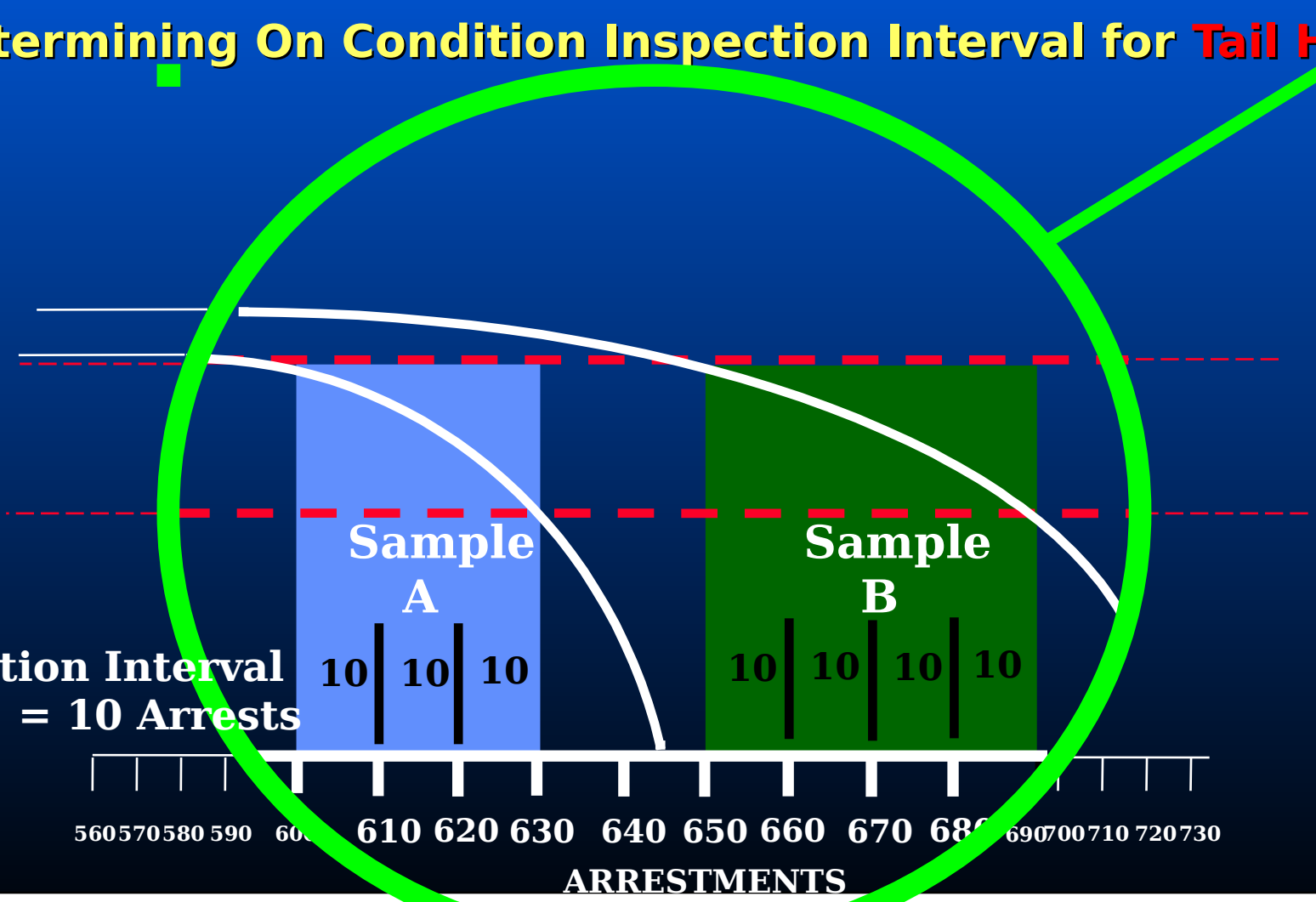


ON CONDITION TASK

Example:

Task Development

Determining On Condition Inspection Interval for Tail Hook



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Determining Task Interval: **Task Development**

Failure modes with Safety Consequences:

- **Goal is to develop task interval that will reduce the probability of experiencing a failure to an acceptable level**

Failure Modes with Non Safety Consequences:

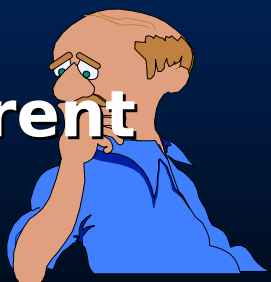
- **Goal is to determine task interval that yields the most cost effective task realizing some functional failures may be OK if overall cost is minimized.**

ON CONDITION TASK

Estimating Methods:

Task Development

- **Engineering judgment using maintenance data, engineering/technical information, SME input, etc.**
- **If PF is unknown but failure mode clearly has a progressive failure mechanism, work backwards from an existing effective task to determine a PF interval**
  - **If current task is less effective than desired, adjust PF as a function of current task effectiveness to get new PF**
  - **Analytical methods provided in NA 00-25-403**



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Determining Task Interval: **Task Development**

Determining whether any particular analytical method is appropriate is the responsibility of the analyst

Common Errors:

- **Getting bogged down by lack of data (use best judgment)**
- **Using existing task interval instead of analyst judgment when NOT appropriate**
- **Lack of documentation of decisions in memo field**
- **Excessive conservatism**
- **Using MTBF**

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Determining Task Interval: **Task Development**

Additional Considerations:

- **Ensure repair actions do not reduce the PF interval, otherwise a new PF interval may be required for repaired items**
- **Explore various inspection techniques**
- **Ensure PF is adjusted for the inspection technique**
- **Ensure published repair limits are consistent with Potential Failures identified by OC tasks**

ON CONDITION TASK

Review and Summary

Module Objective

- Provide detailed information for evaluating and developing an On Condition task.

Introduction

- Learning Objective

Task Development

- Questions to be addressed
  - Identifying Failure Resistance Indicator
  - Identifying Functional Failure Condition
  - Identifying Potential Failure Condition
  - Determining PF Interval
  - Determining Task Interval
- Default Methods

End of Module

up next.....

Hard Time Task